DOCUMENT RESUME

ED 113 057 PS 008 146

AUTHOR Braggett, E. J.
TITLE The Effect of Preschool Kindergarten Attendance on the Cognitive Development of Children of Above Average Intelligence. Summary of an Investigation.
PUB DATE May 75
NOTE 12p.

EDRS PRICE MF-$0.76 HC-$1.58 Plus Postage
DESCRIPTORS Academic Achievement; *Cognitive Development; *Cognitive Measurement; *Early Childhood Education; Gifted; Intelligence Differences; Intelligence Level; Longitudinal Studies; *Preschool Evaluation; *Preschool Programs
IDENTIFIERS *Australia

ABSTRACT

This study attempted to determine whether attendance at a traditional preschool resulted in significant cognitive gains for young children over a 3-year period. The experimental group consisted of 59 children at four preschools. Each was matched with a nonattender on such variables as age, sex, intelligence, and family characteristics. The mean Stanford-Binet IQ was approximately 119. Testing was done before the experimental group began preschool, at the end of their preschool year, at the end of kindergarten, and at the end of first grade. The Stanford-Binet (S-B) and the Peabody Picture Vocabulary Test (PPVT) were the main instruments used in the testing. These were supplemented by tests on reading, mathematics, spelling, and Piagetian concept attainment. The results indicated: (1) significant differences between the two groups on the S-B at the end of preschool, kindergarten, and first grade, with the experimental mean higher than the control; (2) significant PPVT increases by the experimental group but not by the control group; (3) no significant difference between groups on the Piagetian test of operativity at the end of kindergarten, but a significant difference in favor of experimental children by the end of first grade; and (4) no significant differences between the two groups on tests of school performance. (JMB)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED113057

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

SUMMARY

of an

INVESTIGATION

THE EFFECT OF PRESCHOOL KINDERGARTEN ATTENDANCE ON THE COGNITIVE DEVELOPMENT OF CHILDREN OF ABOVE AVERAGE INTELLIGENCE

PS008146

E. J. BRAGGETT

Department of Education
UNIVERSITY OF NEWCASTLE
N.S.W.
AUSTRALIA

MAY 1975

00002

This investigation was conceived in the period 1968-69 when Australia was experiencing the first repercussions of the changes in the theory and practice of preschool education in the U.S.A. The traditional nursery school approach was firmly entrenched in New South Wales, stressing the social, emotional, physical, intellectual and aesthetic needs of children, and catering in the main for a fee-paying middle class clientele. There was relatively little sustained criticism of this approach until 1968 when Australian educational publications outlined developments in other countries, suggesting the need for Australian educators to review preschool education policies and to provide more cognitively structured programs based on the results of overseas research. Amidst the ensuing consternation, the advocates of the child-centred program maintained the superiority of the traditional preschool which they contended provided equally well for all aspects of development, cognitive and affective included. However, neither the commendation nor the denunciation of the approach could be substantiated by reference to Australian evidence owing to the dearth of local publications and the virtual absence of serious research into the effects of preschool education on cognitive development. Hence, the present project was undertaken as a contribution to the study of this field in Australia and as an attempt to provide some of the evidence on which decisions about preschool programs might be based.

The central aim of the research project was to determine whether preschool attendance resulted in significant improvement in areas of cognitive development in young children over a three year period. For this purpose 59 children enrolled at four Newcastle preschool centres during 1971 were chosen as experimental

group Ss, all of whom attended from 9.00 a.m. to 12 noon on five days each week for 42 weeks, a total commitment of just over 200 half days or in excess of 600 hours. Each was matched with a non-attender on the basis of age, sex, measured intelligence, number of children in the family, birth order, geographic living area, the type of dwelling, and intact families. After all parents of children in both experimental and control groups had volunteered consent for their children to be involved in what was termed The Early Childhood Education Project, both parents of each child were interviewed together by the experimenter using a structured interview form designed specifically for the investigation. Data were collected covering a wide range of information on each child's health, friends, play, television viewing, interests, books, toys, general experiences and travel. Other questions related more to the parents themselves: number of children, what they read to the child, games or materials they purchased, interests they cultivated, and activities they deliberately fostered in order to aid their child's development. Finally there was a series of questions related to each of the parents: age, employment, formal education, and why each decided to send the child to a preschool centre or not.

In general it was found that each home consciously provided for indoor and outdoor activities. Children possessed numerous toys, picture and story books, drawing and colouring books, and blocks and building materials. A striking characteristic was the emphasis on language in spoken and written forms, parents reading to their children, teaching them songs and nursery rhymes, and encouraging them to consult books on their own accord. Mobility outside the home was usual, involving travel,

weekend outings, picnics, beach swimming and visits to places of local interest. All but one of the families owned a car: on vacations this family travelled by air. The sample comprised youngsters from relatively enriched home backgrounds, with parents who accepted the importance of formal and informal education and who sought to provide a sound foundation for their children in later life.

At the initial testing session before experimental group children commenced their preschool education in January/February 1971, all Ss were tested on the S-B and the PPVT in their own homes. The same two tests were again administered in the children's homes at the first posttest session at the end of the preschool year in December. Thereafter they enrolled in the kindergarten grade of 20 local Public or Catholic Schools during 1972 and in first grade during 1973, an additional testing session being held in December of each of these two years at the school each child attended. At the end of the kindergarten grade, the S-B and the PPVT were supplemented by the Gates Reading Readiness Test, Test 1 of the Standard Reading Tests, the A.C.E.R. Lower Grades Number Concepts Test, and a Piagetian Test of Concept Attainment. At the final testing session, seven tests were administered, namely the S-B, PPVT, the Cooperative Mathematics Test 12A, the Schonell Spelling Test S2, the Neale Analysis of Reading Ability, Test 1 of the Standard Reading Tests, and the Test of Concept Attainment. The alpha coefficients of internal consistency were determined for the tests employed at the third and fourth testing sessions, these ranging from 0.77 to 0.99.

Statistical calculations included correlated t-tests, analyses of variance with repeated measures, correlations, and

a principal components analysis with varimax rotation of factors, in order to test ten hypotheses against a level of significance set at .05. Where it was pertinent, additional calculations were determined for two subgroups to ascertain whether significant differences existed between the lower and higher IQ children. After administration of the S-B at the first testing session, Ss were matched within the S.E. of the test, so that with the exception of one pair, Ss in all matched pairs were within four IQ points of each other. The mean IQ of the experimental group was 119.35 at the commencement of the project and that of their controls 119.02.

The major results are outlined below.

1. S-B intelligence: The difference between the two groups was ~~found to be~~ significant at the end of the preschool year, the end of kindergarten, and the end of first grade. Over a series of four repeated measures the experimental group reached a peak IQ of 130.02 at the end of the kindergarten grade, and ended the project on 127.86, an 8.51 IQ increase over three years. The control group mean remained virtually static for the first year but rose thereafter to 124.88 and ended on 121.53, a rise of 2.51.

2. PPVT receptive vocabulary: Significant overall PPVT increases were associated with experimental/control group membership. The experimental group recorded significant gains at the end of the preschool year and again at the conclusion of the project. Control group gains, however, were not significant.

3. Piagetian test of operativity: There was no significant difference between the two groups at the end of kindergarten, but by the end of grade 1 the difference attained statistical significance at the level .005.

4. Tests of school performance: No significant differences were found to exist between the mean performances of the two groups on tests of school performance, but trends did favour the preschool attenders. Results on six of the seven performance tests at the third and fourth testing sessions indicated non-significant experimental group superiority, the seventh revealing virtually identical attainment.

The significant gains on the S-B, PPVT and the test of operativity were interpreted as being associated with the period of preschool attendance. The IQ gains, although moderate in comparison with increases reported in some overseas investigations, were relatively substantial in view of the initially high IQ scores of the children and the traditional nature of the preschool program. An analysis of S-B results indicated that the control group was superior at the commencement of the project on four of the five interpretable S-B subscales, two of them, Language and Social Intelligence, reaching statistical significance. At the end of the preschool year, this trend was reversed, all five subscales favouring the experimental group with the Visual Motor result being significant at the level .005. The items on this subscale were found to measure aspects of development which had been specifically emphasised in the preschool program, so that the gains appeared to be attributable to specific preschool experiences. At the conclusion of the study the trends on all but one of the

subscales favoured the preschool attenders, with Language, Conceptual Thinking and Social Intelligence being significant at the .05 level of significance. Again the relationship between specific preschool experiences and the type of S-B items was marked, indicating the probable effects of planned activities in the traditional program. When children attended grade 1, there was a decline in the IQ scores of both the experimental and control groups, the drop being decidedly more pronounced for those with higher IQ scores. The inability of the first grade to capitalise on the intellectual gains resulting from preschool experience was discussed in terms of regression effects, the failure of the teacher to provide adequate learning experiences for the very intelligent children, and the less individualised approach of first grade teaching in general.

Scores on both the PPVT and the Language subscale of the S-B indicated a strong influence on the vocabulary of the experimental group children. It should be stressed that both groups, coming from middle class homes with educationally oriented families, exhibited strong verbal ability so that, for the preschool attenders to record long term significant language gains, denoted a relatively powerful influence on their development. An examination of the preschool program revealed how each child was directed through play to what Bernstein described as 'the verbal channel' so that, in a sense, language behaviour was basic to the traditional preschool approach.

At the conclusion of the kindergarten grade and again at the end of grade 1, children were administered standardised tests of attainment in the areas of pre-reading, reading, spelling and number. On six of the seven tests the experimental group recorded

higher scores, but all results were non-significant despite the gains in psychometric intelligence, Piagetian operativity and vocabulary. On the results of a principal components analysis, it was revealed that different factors for intelligence and school achievement could explain these findings; in addition it was apparent that the items in tests of school attainment measured different attributes of intellectual functioning from items in the S-B. It was hypothesised that, as both groups learnt the basic skills appropriate to grade 1, there could be a diminishing school performance-return operating above a certain minimum IQ level, one above which the rate of learning in areas embracing the basic skills slows down.

The significant gains in operational thinking at the end of first grade were considered attributable, at least in part, to the preschool program, which had deliberately avoided school-type instruction, placing emphasis on the child's need for action and providing a wealth of structured and semi-structured material to aid his development. Teachers had sought to match particular activities to each child individually, had encouraged an attitude of enquiry, and had employed checklists to ensure that a range and progression of activities were mastered. The results appear to coincide with Kohlberg's assertion that a preschool approach employing cognitive conflict, match and sequential ordering of experience might generate general and long term cognitive effects. Failure for these gains to be reflected in scores of mathematical performance was again accounted for by the existence of different factors, indicating that the tests tended to measure two different aspects of intellectual functioning. This was also true of psychometric intelligence and operativity on the one

hand, and operativity and reading performance on the other. No support was found for the findings of Wilkerson et al. (1973) who reported that operativity was extremely important in learning to read.

A series of implications was outlined pertinent to both the theory and practice of education. It was stressed that the intellectually gifted may easily be overlooked in the present desire to provide educational remediation for cultural deficit. Even children with a mean IQ of 119 and with a range of 91 to 161 appeared to benefit from preschool experience, evidencing gains that were sustained longer than by most disadvantaged children in programs specifically designed to meet their needs. Moreover, these gains were associated with the traditional program, an approach that appears to be achieving some favour once again as the long term failures of many of the more structured programs become apparent. At a time when the Australian Government is extending the provision of child care and preschool facilities so rapidly, the advantages of the traditional nursery school approach should not be lost sight of for average and above average children.

It is of considerable consequence that S-B subscale gains were effected in those areas of development on which the preschool program had placed greatest emphasis. This was particularly so of Visual Motor, Language, Conceptual Thinking and Social Intelligence, the elements of which were central to the traditional approach adopted in the four preschool centres. Such results suggest the possibility of modifying the program in slightly different directions, if desired, to suit local needs without necessarily affecting its overall success, provided that

emphasis is still placed on some particular areas of development. What appeared important was the commitment of the teacher to short and long term goals, the acceptance of support and advice from other professionals, planning of activities, and regular meetings with parents, all of which seemed to assist in directing the teacher's approach rather than dictating the children's program.

The kindergarten grade apparently achieved success in providing for the cognitive development of the children during their first year of formal education, both experimental and control groups evidencing intellectual gains. First grade results indicated that the cognitive development of children in the IQ range 100-125 appeared to be catered for much more adequately than that of the superior IQ group who experienced measured intelligence losses. This was true of both groups but even more so of the non-preschool attenders whose sudden decrease wiped out the gains of the previous two years and resulted in a final mean score lower than that obtained at the commencement of the project. The need exists for first grade teachers to examine their curriculum, their teaching strategies, and the psychological rationale on which they base the teaching of skills to children of superior intellect. Furthermore, in view of the possibility that the first grade performance tests are themselves at fault, there is additional need for psychologists and mathematicians to analyse the learning of the basic skills and their application, and to ensure that these processes are reflected in the performance tests in current use.

In what was perhaps the most striking conclusion of the investigation, it was evident that cognitive functioning may be facilitated by the traditional preschool program with above

average children but that the development of cognitive structures may not be unduly hastened in the short term. Some gains were evident at the end of the preschool year, but others only became apparent two years after preschool experience. Finally, despite the importance of both the preschool centre and the school, the parents are still the most potent force in the child's early cognitive development, capable of ensuring the type of experiential background on which the enrichment and stimulation of the preschool centre may build with additional profit.

Wilkerson, J., Lunzer, E., and Dolan, T. (1973) Factors affecting cognitive behaviour of children in their first year of schooling. Paper presented to the 1973 biennial meeting of the International Society for the Study of Behavioural Development, August 1973, Ann Arbor, Michigan.